

Illustration: may differ from specified module

Compact CHP ready for connection, mainly consisting of

- serially manufactured Industrial-Gas-Otto-engine
- air-cooled synchronous generator
- waste-gas heat exchanger integrated in primary cooling circuit
- Oxikat integrated in waste-gas heat exchanger (optional)
- control cabinet with programmable controller and operating unit
- gas train

Integrated heat exchanger basket, mainly consisting of

- expansion tank in motor circuit and mixture circuit
- relief value in motor circuit, mixture circuit and heater circuit
- filling valves, cleanout valves and exhaust valves
- plate heat exchanger
- pumps for motor circuit and mixture circuit
- 3-way mixing valve for return temperature increase

Water and gas connections are executed with compensators.

Motor and generator are connected through a pluggable elastic metal plastics coupler to compensate radial offset, axial offset or angular offset. It is mounted on a framework vibration-cushionedly. Furthermore the framework is uncoupled through oscillation decoupling elements.

The control cabinet is executed as a separate unit. All regulation and control functions as well as control elements are part of the control cabinet. Assisted by a menu-navigated display performance data and state data could be readed and adjusted easily.

The drive of the CHP is caused by a water-cooled, supercharged Otto-Gas-Engine. It is stationary engine designed for permanent operation. A micorprocessor-controlled ignition ensures an optimal adaption of the ignition point and the ignition energy to the gas quality (methane number).

Lambda control is done *without* a lambda probe (oxygen sensor), by means of a calculation program. Using the values Actual Power, Charge Pressure, and Mixture Temperature, the program sets the optimum lambda value for every operating condition.

Besides an exceedingly high electrical efficiency, a double-staged mixture cooling, including a low temperature circuit and a high temperature circuit, leads to an ideal usage of thermal power from the mixture heat.

*The technical data are provisional and may change in the course of development.

Engine data			Engine utilities			
	Hz	50				
Mixture cooling to	°C	50	Lubricate consumption	kg/h	0,2	
RPM	1/min	1500	Filling capacity lubricant	l	96	
ISO standard power (mech.)	kW	569				
Arrangement of cylinders		V	Cooling water recirculated quantity (min.)	m³/h	55	
Number of cylinders		12	Operating pressure (max.)	bar	2,5	
Bore	mm	130	Cooling water temperature (inflow)	°C	82	
Stroke	mm	157	Cooling water temperature (exit)	°C	88	
Swept volume	l	25	Balance (inflow/exit, max.)	K	6	
direction of rotation (look on balance wheel)		left	Mixture inflow temperature after damper (max.)	°C	50	
			Mixture cooling water, inflow temperature low	°C	45	
compression ratio	ε	13 : 1	temperature circuit (max.)			
average effective pressure	bar	18,2	Mixture cooling water recirculated quantity low	m³/h	16	
average piston speed	m/s	7,85	temperature circuit (max.)			
Power data			Efficiencies			
	Hz	50				
Load	%	100	Load	%	100	75 50
Ignition timing	grad	18	Electrical	%	42,6	41,2 39,6
ISO standard power (mech.)	kW	569	Mechanical	%	44,1	42,6 41,4
Electrical power	kW el	550	Thermal	%	45,3	48,4 54,4
			Total (el. + th.)	%	87,9	89,6 94,0
Cooling water heat	kW	211				
Mixture heat (high temperature circuit)	kW	59	Power number		0,94	0,85 0,73
Mixture heat (low temperature circuit)	kW	47				
Waste gas heat up to 180°C	kW	315	Mass flows and volume flows			
useable thermal power at 180°C	kW	585	Combustion air mass flow	kg/h	2.880	
radiant heat of module (max.)	kW	67	Combustion air volume flow	Nm³/h	2.433	
nominal power	kW	1291	Supply air volume flow	m³/h	12.568	
Fuel consumption (mech.)	kWh/kWh	2,27				
Fuel consumption (el.)	kWh/kWh	2,35	Combustible mass flow	kg/h	101	
			Combustible volume flow	m³/h	126	
Temperatures and pressures						
Waste gas temperature after turbine	°C	454	Waste gas mass flow, wet	kg/h	2.981	
exhaus back pressure (max.)	mbar	30	Waste gas mass flow, dry	kg/h	2.832	
			Waste gas volume flow, wet	Nm³/h	2.344	
Heating water return temperature (max.)	°C	70	Waste gas volume flow, dry	Nm³/h	2.105	
Heating water flow temperature (max.)	°C	90				
Pressure decrease heating circuit (max.)	mbar	200	Heating water volume flow (max.)	m³/h	34	
maximum backpressure at the air intake	mbar	15	Technical basic conditions			
Emission value at 5% residual oxygen			Power conditions acc. to DIN-ISO-3046			
NOx	mg/Nm³	< 500	Norm conditions: air pressure: 1000mbar,			
CO	mg/Nm³	< 300	air temperature: 25°C or 295 K, rel. humidity: 30%			
			Gasquality according "2G TA 04 Gas"			
			All data are related to full load engine running at denoted media temperatures and are subject to technical advancements.			
			Equipment as well as installation systems have to meet all technical instructions.			
			When installed > 400 m and/or with intake air temperatures > 30 °C, the power reduction must be determined on a project-specific basis.			

Generator data

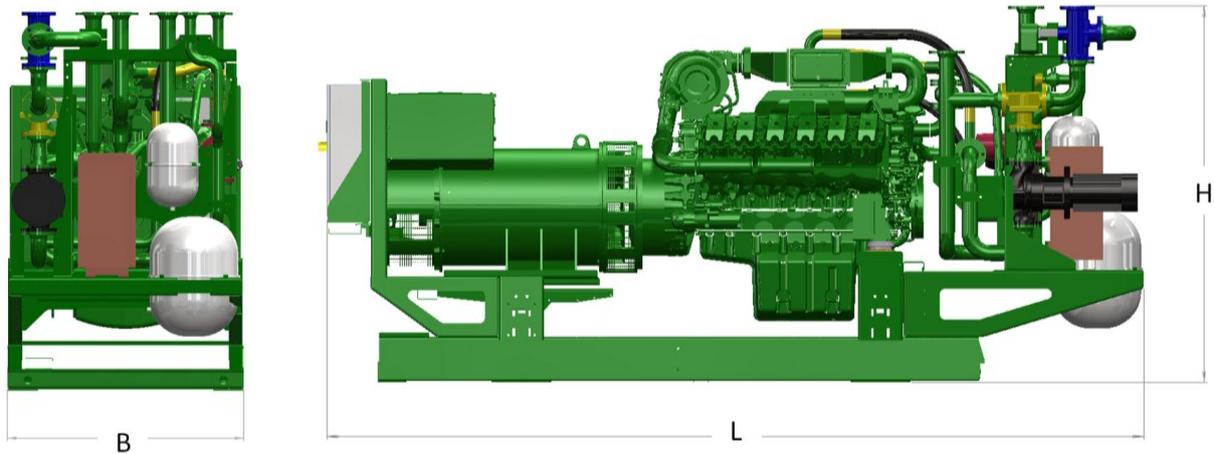
Manufacturer		Leroy Somer
Type		LSA 49.1 L9
Power	kVA	792
Voltage	V	400
Frequency	Hz	50
Rated Speed	1/min	1500
Nominal current at Cos φ = 0,8	A	980
Cos φ		1
Efficiency (full load) at Cos φ = 1	%	96,7
Efficiency (full load) at Cos φ = 0,8	%	95,5
Reactance Xd	p.u.	238
Reactance X'd	p.u.	14,1
Reactance X''d	p.u.	11,2
Mass moment of inertia	kgm ²	11,31
Stator circuit		Stern
Ambient air temperature	°C	40
Protection class		IP 23

Between 0.8 inductive and 0.95 capacitive the Cos Phi is adjustable.
The exact setting is generally given by the utility company.

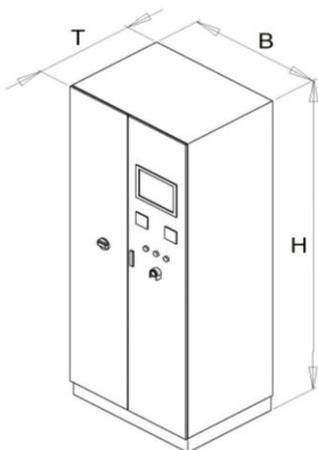
Main dimensions and weights

Module:				
Length (L)	mm		4.560	
Height (H)	mm		2.150	
Width (B)	mm		1.310	
Weight dry (approx.)	kg		5.500	
Control cabinet:				
Height (H)	mm		2.000	
Width (B)	mm		800	
Depth (T)	mm		600	
Weight (approx.)	kg		200	
Power switch cabinet:				
Height (H)	mm		2.000	
Width (B)	mm		600	
Depth (T)	mm		500	
Weight (approx.)	kg		150	

Modul:



Control cabinet:



Power switch cabinet:

